

## *Antenna technology/Physics/Wireless communication*

### **Master Thesis – “Study of antenna array for Bluetooth AoA application”**

The new Bluetooth standard v5.1 supports AoA (Angle of Arrival) and AoD (Angle of Departure). AoA is used for location and the locator device needs an antenna array for finding the direction of arrival. Proant have an antenna concept that can be suitable for such antenna array, the Niche antenna concept, [www.proant.se](http://www.proant.se). The aim of the thesis is to develop a suitable antenna array using the Niche concept and demonstrate the results. This Master Thesis will include:

#### Your responsibilities,

- Develop understanding for wireless communication and the Niche antenna concept.
- Extensive literature study regarding the functionality and usage of the AoA and AoD applications.
- Familiarize yourself with CST MW Studio. Earn basic understanding of the software to enable simulation possibilities for development work.
- Take responsibility, but do not be afraid to ask for help.
- Summarize the results in a report usable to Proant AB.

#### Proant resources,

- Simulation software, CST MW Studio.
- Complete lab, including necessary equipment & semi-anechoic measurement chamber.

#### Your background,

- Engineering student in physics, electronics or similar program.
- Eager to learn and develop.

#### Details,

- Thesis work credits: 30 ECTS/HP.
- Time period: January-June 2021.
- Application: Before December 1, 2020.
- Location: The work needs partly to be performed at Proant AB in Umeå.
- Number of applicants: 1-2
- Earnings: A total sum of 40 000 SEK for Master thesis will be awarded upon the approval of the final report.
- Contact: Tomas Rutfors, [tomas.rutfors@proant.se](mailto:tomas.rutfors@proant.se), Tel: 090-6904157, 090-40150

#### About us,

*Proant AB is a company that develops, manufactures and sells antennas to applications such as, electricity meters, home alarms, and other equipment that needs wireless connection. Customers are often well-known international companies, such as Bosch, GE Healthcare, Weber, Raspberry Pi and Schneider Electric, where Proant together with the customer develops a suitable antenna solution. Proant has a wholly owned subsidiary in Hong Kong that delivers goods directly to customers and more than 95% of deliveries go to the global market outside Sweden. Proant presently have 6 employees and headquarter is in Umeå.*

